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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/658,169

09/09/2003

Jae-Hoon Lee

YPL-0061

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7590

12/14/2004

Michael A. Cantor  
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EXAMINER

NATALINI, JEFF WILLIAM

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/658,169

Applicant(s)

LEE ET AL.

Examiner

Jeff Natalini

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/4/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

***Specification***

1. The specification is objected to because of the following informalities:
  - On pg 7 line 33-34, it is stated “thus there are considerably difference among” this should be corrected to for example “thus there is considerable difference among” or “thus there are considerable differences among”.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Blackburn et al. (6264825).

In regard to claim 1, Blackburn et al. discloses a method for detecting a polymerase chain reaction (PCR) product (col 88 line 5-7) comprising:

- (a) providing at least a pair of electrodes (col 88 line 8-15) in a PCR solution containing vessel (col 90 line 38-42);
- (b) performing PCR (col 87 line 60- col 88 line 15);
- (c) producing an electric field between the electrodes (col 83 line 65 – col 84 line 14); and

(d) measuring a change in a dielectric property in a PCR solution (col 83 line 49-55; bulk impedance is known in the art to be the dielectric property of impedance of the solution between the two electrodes).

In regard to claim 2, Blackburn et al. discloses wherein step (b) the PCR is performed in the absence of an ionically-labeled primer (Blackburn et al. never discloses anything about using an ionically-labeled primer and even talks about non-ionic nucleic acid (col 9 line 7-11)).

In regard to claim 3, Blackburn et al. discloses where the PCR solution-containing vessel is a PCR tube (col 90 line 38-42).

In regard to claim 4, Blackburn et al. discloses wherein the dielectric property is impedance (col 83 line 49-55; bulk impedance is known in the art to be the dielectric property (col 1 line 38-40) of impedance of the solution between the two electrodes).

In regard to claim 5, Blackburn et al. discloses wherein the electric field is produced using an alternating current at a frequency of 1 Hz to 100MHz (col 84 line 11-14).

In regard to claim 6, Blackburn et al. discloses wherein the electric field is produced using an average AC voltage of 1mV to 10V (col 84 line 7-11).

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Miles et al. (Pub 2002/0072054).

In regard to claim 1, Miles et al. discloses a method for detecting a polymerase chain reaction (PCR) product (abstract) comprising:

(a) providing at least a pair of electrodes in a PCR solution containing vessel (abstract);

(b) performing PCR (pg 1, paragraph 6);

(c) producing an electric field between the electrodes (abstract); and

(d) measuring a change in a dielectric property in a PCR solution (abstract).

In regard to claim 2, Miles et al. discloses wherein step (b) the PCR is performed in the absence of an ionically-labeled primer (discusses using an ionically-labeled probe (pg 1, paragraph 9) but lacks specifically stating the use of any primer).

In regard to claim 3, Miles et al. discloses where the PCR solution- containing vessel is a polymerization microchamber (a microfluidic channel (abstract) would broadly define the use of a polymerization microchamber).

In regard to claim 4, Miles et al. discloses wherein the dielectric property is impedance (abstract).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miles et al. (Pub 2002/0072054) in view of Blackburn et al. (6264825).

Miles et al. lacks wherein the electric field is produced using an alternating current at a frequency of 1 Hz to 100MHz and an average AC voltage of 1mV to 10V.

Blackburn et al. discloses the producing an electric field using an alternating current at a frequency of 1 Hz to 100MHz (col 84 line 11-14) and an average AC voltage of 1mV to 10V (col 84 line 7-11).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Miles et al. to produce the electric field using an alternating current at a frequency of 1Hz to 100MHz and average AC voltage of 1mV to 10V in order to have advantages such as being able to monitor the change in bulk impedance (col 83 line 49-55).

### **Conclusion**

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wittwer et al. (2002/0151039) teaches performing PCR where electrodes are located in a sample holder and a current is applied through the electrodes and through the biological sample. Blackburn et al. (6686150) performs PCR, bulk impedance is measured, a test chamber is used for the two electrodes.

Wilding et al. (5587128) teaches a polymerization microchamber method and apparatus for conducting amplification of polynucleotides. Mullis (4683202) teaches a process for amplifying any desired nucleic acid sequences.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Natalini whose telephone number is 571-272-2266. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 571-272-2233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeff Natalini



**N. Le**  
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**Technology Center 2800**